GETINGE

# GETINGE 88-SERIES
## USER MANUAL
## 502404300

SEV0647139-

GETINGE

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# FOREWORD

This instruction manual is intended for users of the Getinge washer disinfector 88-5.
The instruction manual describes the design and operation of the machine and the maintenance for which the user is responsible. The purpose of the information in the manual is to ensure safe operation and optimum efficiency.
Before using the machine for the first time, users must have read this instruction manual and familiarized themselves with the operation of the machine and its safety instructions.

**Read through the instruction manual before using the machine.**

The information in this manual describes the machine as dispatched from Getinge. There may be differences due to customization.
The machine is accompanied by the following documentation:

- User manual (this book)
- Installation manual
- Technical manual
- Spare parts list
- Goods positioning instructions

The Goods positioning instructions supplied must be put up in a clearly visible position at the time of installation.

Getinge reserves the right to change the specification and design without prior notice.
The information in this manual was up to date on the date of issue of the manual.

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# SAFETY REGULATIONS

This machine has been designed with a number of built-in safety devices. To avoid injury, it is highly important not to bypass or disable these safety devices. If the equipment is used in a manner not specified by the manufacturer this can impair the safety equipment on the machine.

**The equipment must be used in accordance with the safety instructions below. If in doubt, contact a representative of the reseller without delay.**

## Important

- Read the instructions thoroughly before use.
- The equipment must only be used by personnel who know about it and are trained to use it. Personnel must also receive regular training on this equipment.
- Take care when handling the chemical agent used in the machine.

Read the details on the container or contact the manufacturer:

- if the agent comes into contact with the operator's eyes or skin or if the vapors are breathed in, etc.
- about storing the agent and disposing of empty containers.

- Take care, because the machine uses hot water and possibly steam.
- Installation and service work must be done by personnel trained in the use of this machine.
- Never bypass the door switch of the machine.
- Leakage in the system, due to a worn door seal for example, must be dealt with immediately.
- The electric power must be cut off before the machine cabinet is opened. (The machine cabinet contains electrical components).
- Make sure that there is always detergent in the bottles. This is important both for the operation of the machine and for keeping the washing chamber free from staining.
- The machine must be kept clean if it is to work properly.
- Do not wash down or hose down the machine with water.
- The machine must not be operated with cladding plates, roof and plinths removed. Doing this puts at risk the safety and functioning of the machine.
- Spare parts may only be obtained from Getinge EDC.

## Product liability

Any modification or incorrect use of the equipment without the approval of Getinge Disinfection AB invalidates Getinge Disinfection AB's product liability.

This product was manufactured by:
GETINGE DISINFECTION AB
Ljungadalsgatan 11, Box 1505
351 15 Växjö, Sweden

CE 0413

## Isolator switch

The machine must be fitted with a separate, lockable isolating device in the electric power supply. The isolating device must be easily accessible on a wall close to the machine. The installation must conform to and be marked in accordance with local provisions.

## In an emergency

- Switch off the main switch
- Close stopcocks in the water and (where present) steam supply lines.



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# INTRODUCTION

## Intended use of the machine

Getinge S-88 series machines are washer disinfectors intended for cleaning, disinfection and drying. Intended fields of application are surgical instruments (solid and tubular), dishes, hand bowls, glass goods, suction flasks, baby bottles, anaesthesia equipment and OP shoes. Depending on program design.

Validation of goods according to intended use is done with Getinge Disinfection AB's standard loads.

An Installation Qualification, an Operating Qualification and a Performance Qualification according to ISO 15883 must be carried out before putting the machine into service.

Incorrect use can result in damage to objects and personal injuries

## Symbols on the machine

Warning, see instruction manual.

Warning, hot surface.

Warning: electrically live parts.

## Attention symbols

Some of the warnings, instructions and advice in this manual are so important that we use the following special symbols to draw attention to them. The symbols used are as follows:

**This symbol indicates a warning in the text of the manual. It warns of a hazard that may lead to more or less severe injury and in certain cases mortal danger. It also highlights warnings to avoid damage to equipment.**

## General

The machine is a fully-automatic washer disinfector for cleaning and disinfecting goods in hospitals, laboratories and the pharmaceutical industry.
The machine has two spray arms and three dockings and can be equipped with several different accessories for different cleaning requirements.
These accessories are presented in a special accessories catalogue.
There are several possible ways of installing and equipping the machine depending on its field of application:

- Heating by electricity or steam.
- Connecting treated water
- Extra dosing pumps which allow chemical disinfection of heat-sensitive goods, for instance.
- Infeeder/outfeeder
- Air Glide System (AGS)
- Automatic program selection (basket indication)
- Fixed scanner
- Control panel



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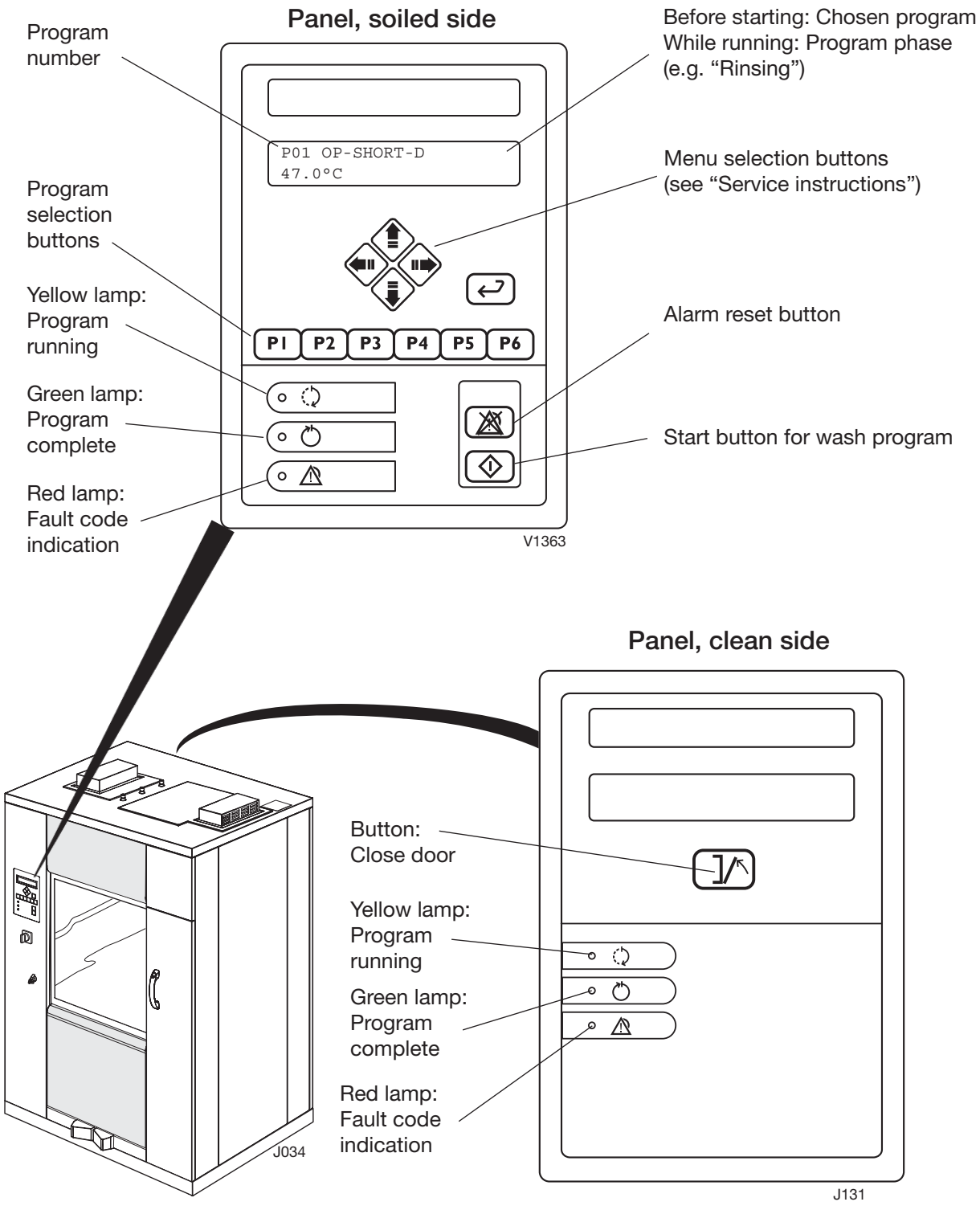
The machine is operated from the control panels, one to the left of the door on the soiled side and one on the right of the door on the clean side. The picture below shows the location of buttons and indicators on both panels.



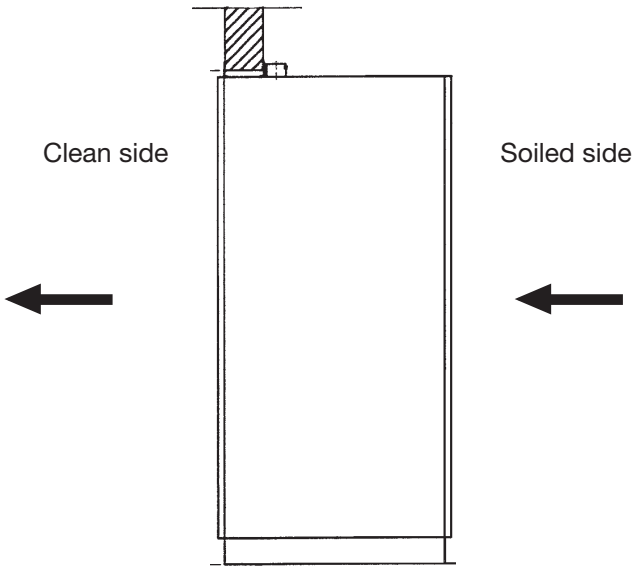
## Control system

The machine has an electronic controller which can hold up to 64 programs, 16 of which can be started (activated). You can choose six of these programs with the program selection buttons. To choose the others, use the menu buttons; see under Operating instructions. The machine comes with a number of standard programs in the control system (see the separate program sheet). Contact your reseller for customized programs.

**Programming may only be done by authorized personnel.**

## Door function

The machine has double vertical sliding doors.
Both doors can be motorized for automatic opening and closing. The doors have effective crush protection. When it is activated, they reverse.
The doors of the machine have a system of interlocks to ensure that only one door can be opened at a time. This means that the clean-side door must be closed and locked by pressing the button before the dirty-side door can be opened.
When you press , the door is locked and a yellow lamp flashes for about 5 seconds.
If is pressed again during this “cancel time”, the dirty-side door is unlocked and the door can be opened manually or alternatively it opens automatically.
In standby mode, the door can be opened and closed with by pressing the button for 10 seconds.
When (on the soiled side) is pressed, the door is closed and locked, the yellow lamp flashes and the program starts.
When the program is complete, a green lamp lights up on both sides and the clean-side door opens automatically. When the door is fully open the green lamp goes out on both sides.
The clean-side door must be closed and locked by pressing the button before the soiled-side door opens automatically.



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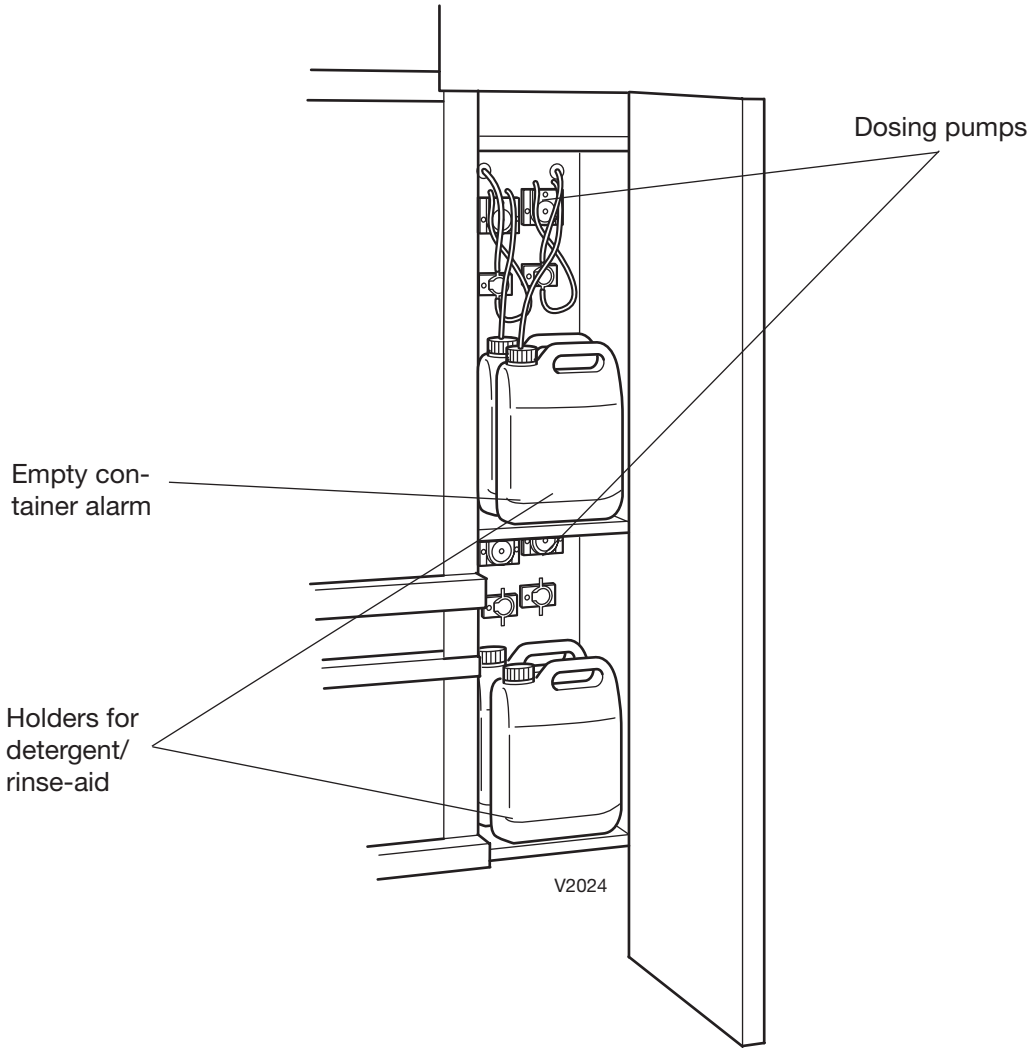
## Dosing system

In standard form, the machine has two dosing systems. One is for alkaline detergent and one is for rinse-aid or acid detergent. The dosing amount can be set individually for each program.

The machine cannot be started until detergent has been added. If the detergent holder is empty, "`DOS 1 LOW LEVEL`", for example, appears on the display.

A third and a fourth dosing system for heat-sensitive goods or instrument milk, for example, can be installed.



# OPERATING INSTRUCTIONS

## Machine without barcode scanner

### Loading goods to be washed into the machine

- Load the items to be washed on to the trolley and run the trolley into the machine. Examples showing how to load the trolley are shown on the goods positioning sign and in the loading handbook.
- The trolley may be loaded with **Max 75 kg.**
- Make sure that the washer arms can rotate freely without touching the goods.

### Select the program.

- Choose a program in one of the following ways:

- Press one of the program selection buttons P1 - P6
- Press ↵. The display now shows “CHOOSE PROGRAM”.

  Press ↵ again.

  Choose a program from the list with ◇ and ◇.

  Press ↵ to confirm your choice.

- You can see the machine programs on the separate program sheet.
- Press ◇. A yellow lamp flashes for 5 seconds. During this time, the program can be aborted by pressing ◇ again.

**A fine filter must be used when cleaning and disinfecting tubular instruments with a passage smaller than 2 mm, to prevent particles getting stuck in the instruments. Blocked or reduced water flow may result in cleaning and disinfection failing to take place.**

**If the program is cancelled after start, the cleaning result and disinfection will be unsuccessful.**

### While a program is running

While the program is running, a yellow lamp at ◌ is lit and the program phase (e.g. “Rinse”) and the current temperature are shown on the display. Press ↵ to see how much time remains.

### When the program is complete

- When the program is complete, a green lamp lights up at ⏻ and the clean-side door opens automatically.

**If the items are still hot after a program, handle them with care to avoid burns.**

- Empty the machine, close and lock the clean-side door by pressing ]/↖.
- If the same program is to be used again, there is no need to select the program again. Simply press ◇ once.

**Note!**
**The display switches to standby mode after 30 minutes and returns automatically when a program is started or selected.**



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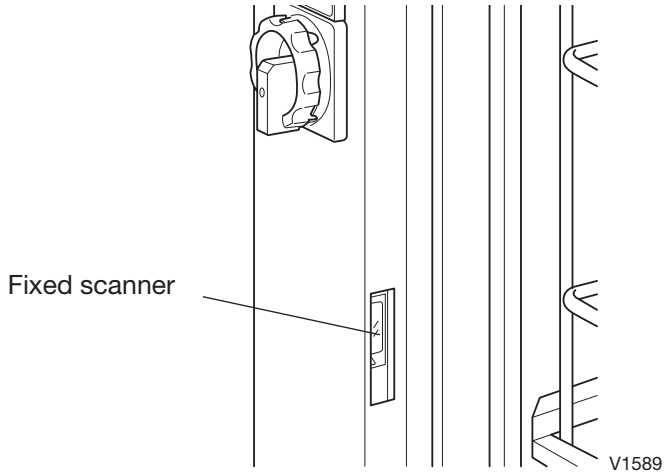
## Machine with barcode scanner

Every wash trolley has its own unique five-digit number. The first two digits indicate which wash program is to be used; the third digit is for extra equipment and the last two are the trolley's ID.

### Loading goods to be washed into the machine

- Load the items to be washed on to the trolley and run the trolley halfway into the machine. Examples showing how to load the trolley are shown on the goods positioning sign.

**A fine filter must be used when cleaning and disinfecting tubular instruments with a passage smaller than 2 mm, to prevent particles getting stuck in the instruments. Blocked or reduced water flow may result in cleaning and disinfection failing to take place.**




### Choosing a program

- Scan the barcode of the trolley with the barcode scanner. For a machine with a fixed scanner, the trolley must be moved so that the barcode gets scanned. On the basis of the barcode, the machine automatically chooses the correct wash program.This is what to do if you want to use a different washing program from the scanned one:

- Press one of the program selection buttons P1 - P6
- Press ↵. The display now shows "CHOOSE PROGRAM".
  Press ↵ again.
  Choose a program from the list with ◈ and ◈.
  Press ↵ to confirm your choice.

- Run the trolley into the machine.
- Close and lock the door. The program then starts automatically.

**If the program is cancelled after start, the cleaning result and disinfection will fail to take place.**

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## While a program is running

While the program is running, a yellow lamp at ⟳ is lit and the program phase (e.g. “Rinse”) and the current temperature are shown on the display. Press ↵ to see how much time remains.

## When the program is complete

- When the program is complete, a green lamp lights up at ⏻ and the clean-side door opens automatically.

**If the items are still hot after a program, handle them with care to avoid burns.**

- Empty the machine, close and lock the clean-side door by pressing ]/↖.



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## Positioning the items

**Note:**
**All vessels must be carefully emptied before being loaded in the machine.**

- Use inserts and special inserts efficiently and only for the goods and utensils to be washed.
- Ensure that the water jets reach all surfaces of the goods. Surfaces that are covered in some way will not be perfectly clean.
- Do not block the washer arms.
- Make sure that the strainers in the machine are clean and that the water can flow through these. It is important to clean and check the strainers regularly.
- Empty all vessels to be washed before positioning them in the machine.
- Placer sharp and pointed utensils so that they can not cause injuries when loading and unloading.
- Make sure that utensils do not lie on top of each other and in a manner that prevents the water from reaching all surfaces.
- Place vessels with openings downwards in the inserts. It must be possible for the water to flow freely in and out of the vessels.
- Goods with domed bases are positioned at an incline so that water does not collect on the domed surface.
- Anodised aluminium and nickel plated instruments are not suitable for washing in the washer disinfector.
- Rigid endoscopes must be dismantled according to the manufacturer's instructions before washing.
- Open all valves and remove covers and seals so that the ducts are properly rinsed to produce the required cleaning result.
- Optics and light cables must be approved for thermal disinfection by the manufacturer.
- The goods must be distributed evenly over the surface.

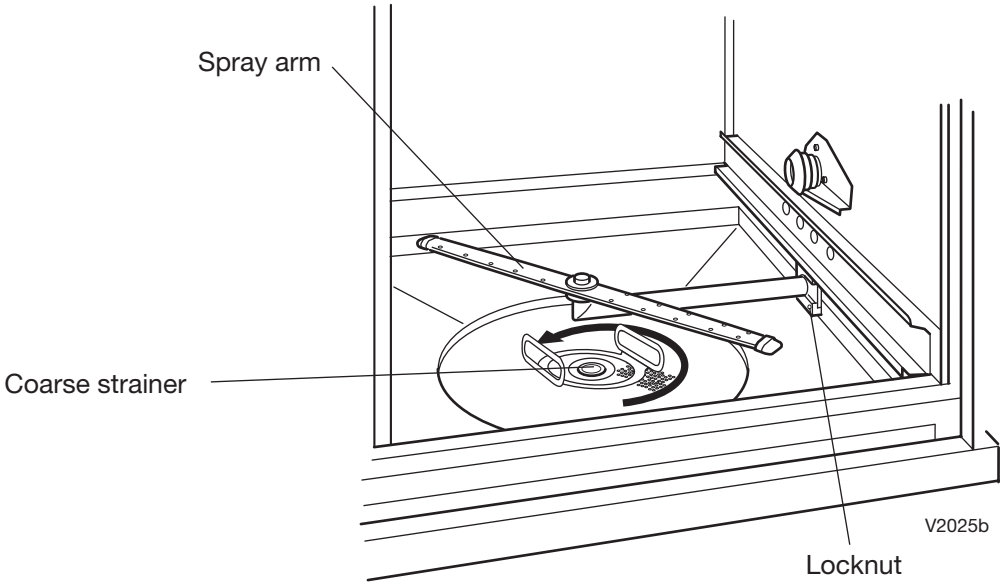
## Handling detergent

**Empty out all residues of acids, especially hydrochloric acid, solvents and chloride based solvents from the vessel before it is placed in the machine.**

- Pre-treatment with, e.g. detergent or disinfectant and some types of dirt can cause increased lather. The lather can affect the washing and disinfection result.
- Follow the manufacturer's instructions carefully with regard to detergent and special products. In order to avoid damage to material and chemical reactions (e.g. oxy-hydrogen gas) the detergent must only be used for purposes prescribed by the manufacturer.
- Handle liquid agents (cleaning, rinse, disinfection and neutralizing agents) with care. These agents usually consists of acids or lye. Do not add organic solvents as this can bring about an explosion risk. Wear protective glasses and protective gloves when handling agents. Always follow the manufacturer's safety instructions which regard to handling chemical agents.
- Do not use detergent for household dishwashers.
- Follow the detergent manufacturer's dosage instructions. The cleaning effect can vary between different detergents. If the cleaning result is not satisfactory, try another quality detergent before contacting Getinge.

## Daily inspection

- Check that no objects have fallen down into the bottom of the washing chamber. Loose objects may cause blockages and seriously reduce the performance of the washer disinfector.
- Check that the spray arms can rotate freely. Check that the holes in the spray arms are not blocked. Blocked spray holes may adversely affect the cleaning result.
- Check that the goods to be cleaned are retained in the insert.
- If the arms need cleaning, remove them by unscrewing the central nut. The arm can then be lifted off and washed clean. Check that the arm can rotate freely when re-installed.
- Remove and clean the strainer in the bottom of the washing chamber. A dirty coarse strainer may prevent water from circulating and create the conditions for the growth of bacteria.
- If this is required for cleaning, open the strainer by removing the spray arm. To do this, slacken the locknut and move it sideways. Then, using the handles, turn the counter-clockwise and lift it out.




- Open the detergent containers and check that they contain detergent/rinse-aid.
- Check that the wash trolley docks properly to the water connections.
- Check the accessories of the machine visually with regard to their intended use and function. For example, blocked ducts, worn and missing parts that might affect the performance of the machine. Water must be able to flow freely through the ducts in tubular instruments.
- Check that the spring movement of the docking mechanisms moves easily. Press in the docking mechanism and release it. It must return to its initial position.
- Check the cleaning instructions of the goods manufacturer.
- To achieve the intended level of performance and safety, distribute the load evenly over the washing surface.
- Check the cleaning result visually when the process is complete.
- The spray arm journal must be checked daily and replaced every five years.
- Check the process valve for deposits and dirt in the diaphragm.
- Check the drain valve for deposits and dirt in the diaphragm.



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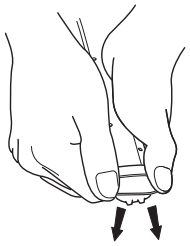
## If necessary

### Spray arm

Clean the spray arms when necessary by unscrewing the central nut, lifting off the spray arm and rinsing it until it is clean. Take off the plastic end pieces by pressing the metal bar over the edge of the rinse arm and removing them. Using a washing brush, clean the inside of the spray arm.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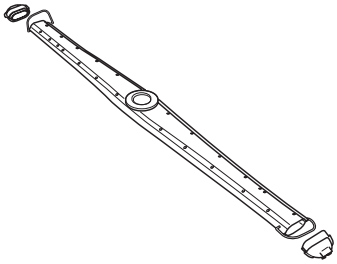
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After cleaning, press the metal bar back into the groove in the plastic end piece. Check that the arm can rotate freely when re-installed.

### Washing chamber

Do not allow deposits to form in the wash chamber. Remove any deposits as follows:

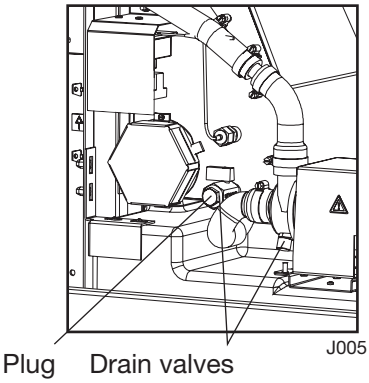
- Open the door and dispense 200 ml NEODISHER BU descaler (sold by Dr. Weigert) into the washing chamber.
- Close the door and run the descaling program.

**NOTE: There must not be any items in the machine with this program. It is only used to descale the machine and insert.**

### Process tank/Booster tank

If machine has not been used for some time (48 hours) the booster tank must be drained and program number 16 run.

**Make surethat the machine is isolated from the electric power and that the water and steam connections are shutoff. Before starting work.**



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To drain the booster tank, dismantle the front trim panels on the soiled side. Drainage is then done via a drain valve located on the soiled side of the tank. Make sure that the tap is not open before unscrewing the plug. If a nipple with G ¼ male thread is used, together with the associated hose, the hose can be fitted to the drain tap.
The tank can now be drained. The capacity of the tank is about 32 litres.
After draining, check that the drain tap is working properly. Seal the plug with PTFE tape and refit it.

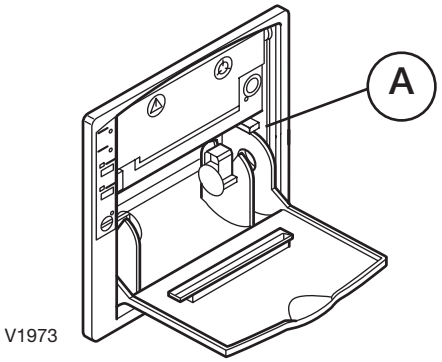
### The outside

The front and side walls can be cleaned and disinfected with an alcohol-based cleaning agent, medical spirit or an ordinary cleaner. The control panel can be cleaned in the same way. To remove stains, use ordinary stainless steel cleaner.
It is important to maintain a good level of hygiene around the machine.

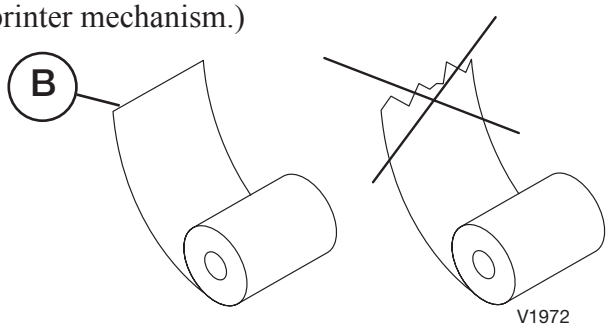
# Printer (Option)

## Replacing the paper roll

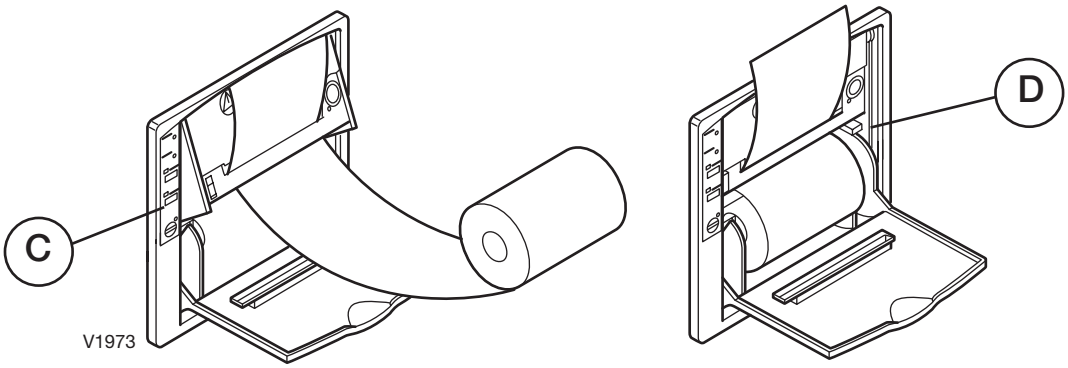
- Open the front door of the printer.
- Remove any paper residue.
- Fold down the printing mechanism by pressing the latch marked PUSH (**A**).




- Cut the end of the new roll square (**B**). (This makes it easier to thread the paper into the printer mechanism.)




- Insert the paper into the opening of the print mechanism and press the FEED (**C**) button on the printer. The paper is now automatically fed through the printer mechanism.
- Fold away the printing mechanism and lock it with the latch (**D**).




- Tear off the paper and close the front panel of the printer.
- The printer is now ready to use again.

**Never use the printer without paper and/or ink ribbon.**
**Do not pull on the printer feed when the printer is on.**



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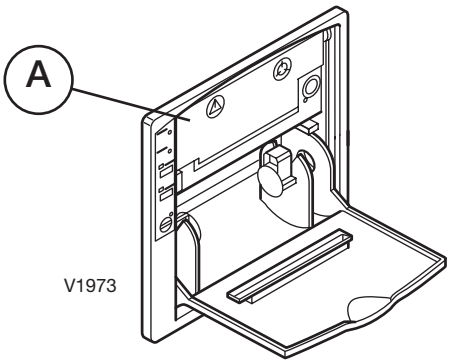
## Ribbon cassette replacement

- Open the front door of the printer.
- Remove the ink ribbon by pressing gently on the left-hand side of the ribbon cassette.




- Insert the new ribbon cassette. The printer is now ready to use again.

**Never use the printer without paper and/or ink ribbon.**

# PROCESS

## Changing parameters

Normally the preset parameter settings of the installed programs are used, but in special cases it may be necessary to adjust certain parameters for matching to a specific wash process. Information about the parameters that can be changed and their limit values can be found under heading “A- or P-parameters” in Chapter 4 of the service manual.

## Printing out a program for a machine with printer (option)

An example of a program printout is shown below. In the example, program P02 OP-D, programmed on menu selection button [P2] is used.

```
PROGRAM:P2 OP-D
DATE:02/05/2006
PROCESS START:13:44:46
MACHINE NAME:88-5
MACHINE NO:2
CYCLE COUNTER:53

PARAMETER
WASH 1 DOS TEMP      35.0C
WASH 1 DOS 1         200
WASH 1 Temp.         60.0
WASH 1 time          00:03:00
FINAL R DOS TEMP     80.0
FINAL R DOS 3        00:00:21
DISINF TIME          00:01:00
DISINF TEMP          90.0
DRYING TEMP          90.0
DRYING TIME          00:18:00

SIGNALS
A107          TEMP INDEP. CHAMB
----------------------------
PROGTIME             A107
----------------------------
PH1-START
00:00:00             30.8
00:00:40             30.7
----------------------------
PH220-PRE RINSE 1
00:01:10             31.0
----------------------------
PH25-WASHING
00:02:51             18.1
00:04:52             35.2
DOS START
00:05:53             39.9
DOS.STOP
DOS AMOUNT           202ml
00:09:17             60.0
00:10:17             60.8
00:11:17             61.9
00:12:17             61.5
----------------------------
PH330-RINSE 1
00:13:29             61.5
----------------------------
```

```
PH360-RINSE 2
00:14:46             55.5
----------------------------
PH440-Final rinse
00:16:03             53.5
00:19:53             80.1
DOS START

00:20:15             81.5
DOS.STOP
DOS AMOUNT           230ml

00:21:26             90.0
CONDUCTIVITY 2 uS/cm

00:21:27             90.1
DISINF START

00:22:27             92.3
DISINF STOP
00:22:45             91.7
----------------------------
PH900-DRYING
00:22:46             91.7
00:34:27             80.8
----------------------------
PH1000-ENDING
00:34:49             81.1
----------------------------

SIGNATURE: .........
```



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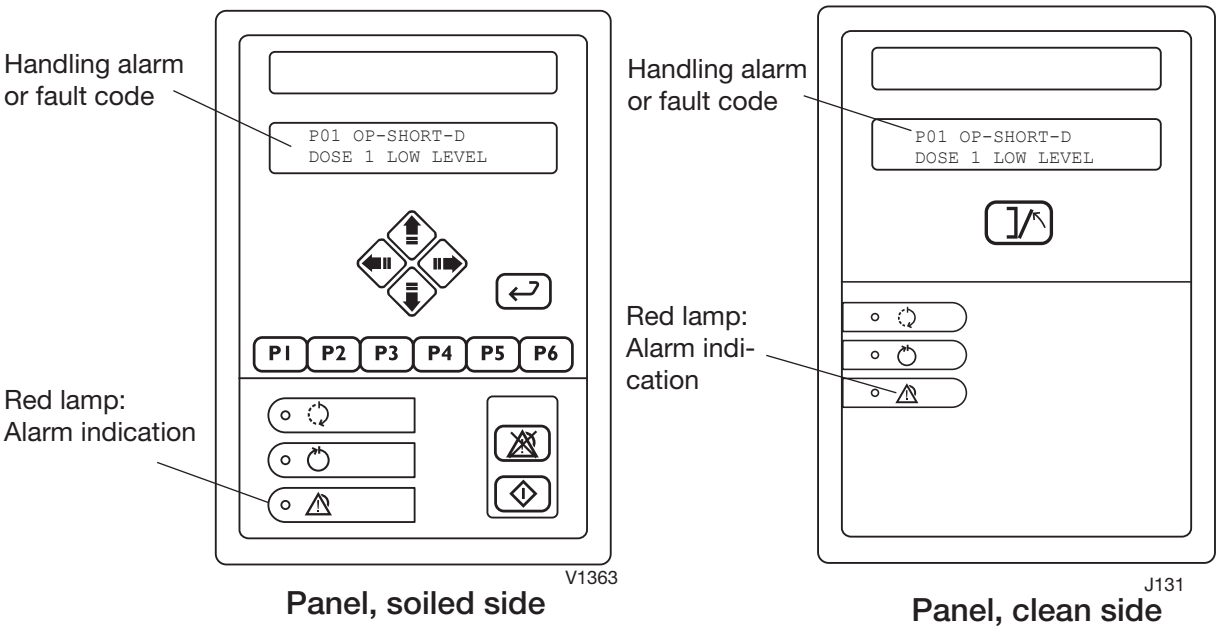
# FAULT INDICATIONS




## Handling alarms

Handling alarms appear on the display in plain text.

The machine cannot be started until the fault has been put right.
The following handling alarms can be displayed:

| | |
|---|---|
| **DOSE 1 LOW LEVEL** | Empty container alarm 1, if detergent 1 is finished, a handling alarm is generated. The alarm is reset automatically when detergent is added. |
| **DOSE 2 LOW LEVEL** | Empty container alarm 2, if detergent 2 is finished, a handling alarm is generated. The alarm is reset automatically when detergent is added. |
| **DOSE 3 LOW LEVEL** | Empty container alarm 3, if detergent 3 is finished, a handling alarm is generated. The alarm is reset automatically when detergent is added. |
| **DOSE 4 LOW LEVEL** | Empty container alarm 4, if detergent 4 is finished, a handling alarm is generated. The alarm is reset automatically when detergent is added. |

**Note!**
**When the handling alarm is activated (appears on the display) there is always enough detergent left for one run; in other words, if you have started a program it can run to the end.**

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## Alarms

If the red lamp at ⚠ lights up, the process has been aborted because of a fault. The display shows a fault code,

### Acknowledging a fault code

Acknowledge the fault code as follows:

- Note the fault code
- Cancel the acoustic signal by pressing [⚠]. The machine remains locked but the program has been stopped.
- Correct the fault or call service personnel.
- Press [⚠]. The display shows the password entry menu.
- Enter the password (558387) using the arrow keys and press [↵]. All liquid is drained from the machine and the soiled-side door is unlocked*.
- Open the door and remove the items.

**The items in the machine are not clean and must be washed again from the beginning with a new program.**

**If the items are still hot, handle them with care.**

*** If the drain pump is faulty, water cannot be drained from the machine and the fault cannot be put right until the door has been opened. The soiled-side door is unlocked as soon as the password is confirmed.**

## Fault codes in the machine

Fault codes indicate that a serious fault has occurred in the machine or the washing process. The fault must be put right by an authorized service technician.

| Fault code | Description |
|---|---|
| A00 | Power failure |
| A02 | The process tank takes more than 2 minutes to fill with water. |
| A03 | The booster tank takes more than 2 minutes to fill with water. |
| A04 | The washing chamber takes more than 20 seconds to empty. |
| A05 | Water leakage in the dryer. |
| A06 | The soiled-side door does not lock within 10 seconds of program start or if the door is opened while a program is running. |
| A07 | The soiled-side door does not unlock within 10 seconds. |
| A08 | The soiled-side door does not close within 20 seconds of program start or if the door is opened while a program is running. |
| A09 | The soiled-side door does not open within 20 seconds of the program ending. |
| A10 | The clean-side door does not lock within 10 seconds of the program starting or if the door is unlocked while a program is running. |
| A11 | The clean-side door does not unlock within 10 seconds of the end of a program. |
| A12 | The clean-side door does not close within 20 seconds of program start or if the door is opened while a program is running. |
| A13 | The clean-side door does not open within 20 seconds of the end of a program. |
| A14 | Not enough detergent 1 dosed |



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| Fault code | Description |
|---|---|
| A15 | Not enough detergent 2 dosed |
| A16 | Not enough detergent 3 dosed |
| A17 | Not enough detergent 4 dosed |
| A18 | High conductivity. |
| A19 | Low pressure in drying unit. |
| A20 | High pressure in drying unit. |
| A21 | Low pressure from circulation pump. |
| A22 | High pressure from circulation pump. |
| A23 | Low temperature in drying unit. |
| A24 | Faulty temp sensor in booster tank. |
| A25 | Faulty temp sensor (controlling) in wash chamber. |
| A26 | Faulty temp sensor (independent) in wash chamber. |
| A27 | Faulty temp sensor in dryer unit. |
| A28 | Faulty temp sensor in wash chamber. (Temperature too low because of a heating fault). |
| A29 | Faulty temp sensor in wash chamber. (Sensor fault) |
| A30 | Faulty temp sensor in wash chamber. (Temperature too high because of a heating fault). |
| A31 | High temperature in drying unit. |
| A32 | High temperature in booster tank. |
| A33 | Low disinfection temperature. |
| A34 | The drain tank takes more than 3 minutes to empty. |
| A35 | The waste outlet valve of the process tank does not reach the open or closed position. |
| A36 | The waste outlet valve of the wash chamber does not reach the open or closed position. |
| A37 | The wash chamber tank takes more than 25 seconds to fill with water. |
| A38 | Faulty temp sensor in booster tank. (Temperature too low because of a heating fault.) |
| A39 | External stop signal. |
| A41 | Faulty circulation pressure sensor. |
| A42 | Faulty pressure differential sensor in drying unit. |
| A45 | Monitoring system: Disinfection time + 60 sec. See under **“Fault codes in independent monitoring system.”** |
| A46 | Monitoring system: Discrepancy between temperature sensors in the chamber; see under **Fault codes in independent monitoring system.”** |
| A47 | Monitoring system: High conductivity; see under **“Fault codes in independent monitoring system.”** |
| A48 | Monitoring system: Disinfection time + 60 sec. See under **“Fault codes in independent monitoring system.”** |
| A49 | Monitoring system: Too little detergent dosing (it takes more than 5 minutes to reach sufficient volume), see under **“Fault codes in independent monitoring system.”** |

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# Detergents

The machine has been tested with Getinge detergents. We recommend that you use Getinge detergent or equivalent detergent from a reputable manufacturer.

**Do not use detergent for household dishwashers.**

The recommendation of chemical agents does not mean that the manufacturer of the machine bears responsibility for the effects of these agents on the goods. Changes to composition, conditions, etc. that the manufacturer has not been informed of can affect the cleaning quality of the washing result.

## Getinge detergent for mechanical washing of:

**A** - Surgical instruments **B** - MIS-instruments **C** - Anaesthesia equipment
**D** - OP-shoes **E** - Containers **F** - Baby-bottles
**G** - Lab glassware

| Products | Alkalinity | Surfactants | Phosphates | Enzymes | Suitable for optics and anodized Alu. | Goods to be washed |
|---|---|---|---|---|---|---|
| Getinge Power Wash | Amines | + | - | + | + | A, B, C, D, E |
| Getinge Wash Extra | Alkaline salts | - | + | - | (+) | A, C, D, (E), F |
| Getinge Wash Intensive | Caustic soda | + | - | - | - | A, C, D, F |
| Getinge Wash Enzyme | - | + | - | + | + | A, B, C, D, E |
| Getinge Wash LAB | Caustic soda | - | - | - | - | G |

## Acidic detergents and neutralizing agents

| Products | Acids | Effects | Prewash for | Dosage lab glassware |
|---|---|---|---|---|
| Getinge Neutralization P | Phosphoric acid, Citric acid | Neutralization of alkaline residues, removal of mineral residues, e.g. rust and lime | Removal of mineral residues | First rinse after the alkaline wash for neutralization or prewash |
| Getinge Neutralization | Citric acid | Neutralization of alkaline residues | | First rinse after the alkaline wash |

## Lubricants and rinse aids

| Products | Ingredients | Effects Dosage | |
|---|---|---|---|
| Getinge Instrument milk | Paraffinum perliquidium emulsifying agents | Lubrication of instruments | Final rinse |
| Getinge Rinse | Surfactants | Reduction of surface tension of water, improved drying | Final rinse |

## Flusher detergents

| Products | Alkali | Dispersion agents | Complexing agents | Surfactants |
|---|---|---|---|---|
| GD Wash | + | - | ++ | + |
| GD Flush | - | ++ | + | - |

Getinge detergents can be ordered from resellers of Getinge products.



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# Water quality - washer disinfectors

The quality of the water used in all stages of cleaning is important for good results.

The water used in each stage must be compatible with:
* The material of which the washer disinfector is made
* The chemicals used in the process
* Process requirements for the various stages of the process

The main factors for good water quality are:

| | |
|---|---|
| **Hardness** | High hardness will cause lime scale deposits in the washer disinfector, leading to poor cleaning results. |
| **Ionic contaminants** | High concentrations of ions can cause corrosion and pitting of stainless steel. Heavy metals such as iron, manganese or copper cause instruments to tarnish. |
| **Microbial contaminants** | The water used should not increase the biological load on the equipment that is being treated against micro-organisms and their residual products which may cause fever-like symptoms when they get into the human body. |
| **Sanitary chemicals** | High concentrations of and high exposure to sanitary chemicals may cause corrosion and pitting on stainless steel. |

Getinge Disinfection AB therefore recommends that water used in the pre-rinsing, washing and final rinsing phases should be of drinkable quality in accordance with the guidelines. Detailed information about acceptable water quality can be found in "Guidelines for Drinking Water Quality 3rd Edition" published by WHO.

Getinge Disinfection AB also recommends following local standards. RO (reverse-osmosis) water (or similarly treated water) is used for the final washing/disinfection phase. A typical specification for RO water is:

| | |
|---|---|
| pH | 5.5 to 8 |
| Conductivity | <30 µs.cm$^{-1}$ |
| TDS | <40 mg/l |
| Maximum hardness | <50 mg/l |
| Chlorine | <10 mg/l |
| Heavy metals | <10 mg/l |
| Phosphates | <0.2 mg/l as $P_2O_5$ |
| Silicates | <0.2 mg/l as $SiO_2$ |
| Endotoxins | <0.25 EU/ml |
| Total number of micro-organisms | <100 per 100 ml |

Further advice should also be obtained from the manufacturers of chemical and medical equipment.

Where local standards are stricter that Getinge Disinfection AB's recommendations, they should be followed. Note that it is the customer's responsibility to supply the washer disinfector with suitable water.

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